# Xiurui Zhao (赵修瑞)

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## Research Interests

**Active Galactic Nuclei and Supermassive Black Holes, Extragalactic Survey**

## Appointments & Fellowships

**California Institute of Technology, Pasadena, U.S.** **Oct 2024-**
Visiting Scholar

**University of Illinois Urbana-Champaign, Urbana, U.S.** **Oct 2023-**
Post-Doctoral Research Fellow, Advisor: Prof. Yue Shen

**Center for Astrophysics | Harvard & Smithsonian, Cambridge, U.S.** **Sep 2021-Jun 2023**
Post-Doctoral Research Fellow, Advisors: Dr. Francesca Civano, Dr. Martin Elvis

**Center for Astrophysics | Harvard & Smithsonian, Cambridge, U.S.** **May 2020-May 2021**
Pre-Doctoral Fellow, Advisor: Dr. Francesca Civano

## Education

**Clemson University, Clemson, U.S.** **Aug 2016-Aug 2021**
Ph.D. in Astrophysics, Advisor: Prof. Marco Ajello
Dissertation: *Heavily Obscured Active Galactic Nuclei in NuSTAR Era*

**Lanzhou University, Lanzhou, China** **Sep 2012-Jun 2016**
B.Sc. in Physics, Cuiying Honors College

## Honors and Awards

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| Clemson University Outstanding Graduate Researcher Award (2 winners each year) | **2021** |
| Clemson Science College Outstanding Graduate in Discovery Award | **2021** |
| Clemson Physics Department Graduate Research Assistant Award | **2021** |
| SAO Predoctoral Fellowship | **2020-2021** |
| Clemson Graduate Student Travel Grant | **2019, 2021** |
| Cuiying Honors College Abroad Study Fellowship | **2014, 2015** |

## Accepted Scientific Proposals as PI

**18** accepted X-ray/optical/sub-mm proposals with **$370k** grant as PI.

- **X-ray (1.6 Ms)**

- ***NuSTAR*** Cycle 9 (**Large**, 500 ks *NuSTAR* + 142 ks XMM, $130k) **2023**
  *"Systematically Constraining the AGN Coronal Properties with NuSTAR Using a Sample of Luminous, High-redshift Quasars"*
- ***NuSTAR*** Cycle 8 (**Large**, 600 ks *NuSTAR* + 195 ks XMM, $150k) **2022**
  *"Constraining the Properties of AGN Coronae using a Sample of Luminous, High-redshift Quasars with NuSTAR"*
- ***NuSTAR*** Cycle 7 (100 ks *NuSTAR* + 60 ks XMM**,** $90k) **2021**
  *"Unveiling with NuSTAR the most powerful, heavily obscured, quasar ever discovered in X-rays"*
- ***Swift***-XRT Cycle 19 (18 ks) **2022**
  *"Building with Swift/XRT a Sample of Luminous, High-redshift Quasars to Constrain the Properties of AGN Coronae"*
- ***Swift***-XRT ToO (3 ks) **2021**
  *"Measure the X-ray flux of a rare coronal line event quasar exhibiting another optical flare"*

● **Optical (8.5 nights)**

- **SOAR** 4m Goodman (1 night) **2024B**
  *"Identify X-ray Bright Quasars to Constrain the AGN Coronae"*
- **BOK** 2.5m BCSpec (2 night), Co-PI **2024B**
  *"Redshifts of X-ray Bright Quasars to Constrain the AGN Corona"*
- **MMT** 6.5m Hectospec (0.3+0.3 night**,** 335 sources) **2022B & 2023A**
  *"Complete the Hectospec Spectroscopic Survey of JWST NEP Time-Domain-Field"*
- **MMT** 6.5m Binospec (0.1+0.1+0.2 night) **2022A & 2022B & 2023A**
  *Monitoring a Coronal Line Event AGN*
- **MMT** 6.5m Binospec (0.4 night, 6 sources) **2023A**
  *Identify X-ray Bright Quasars and Constrain the AGN Coronal*
- **SAO FLWO** 1.5m FAST (0.2 night) **2023A**
  *Measure the Black Hole Mass of an X-ray Bright Quasar to Constrain Its Coronal Properties*
- **SAO FLWO** 1.2m Keplercam (1+1+2 night, *g*, *r*, *i*) **2023A & 2022B & 2022A**
  *"Monitoring the Continuous Optical Flares of a Coronal Line Event"*

● **Sub-mm (3 tracks)**

- **Submillimeter Array** (SMA) standard science observation (3 tracks) **2022B**
  *"Mornitoring with SMA a Highly Variable Flat Spectrum Radio Quasar in the JWST North Ecliptic Pole Time-Domain Field"*

## Collaboration & Professional Service

- Core Member of ***HEX-P*** Black Hole Growth & Corona Working Group **2022-**
- Member of *JWST* PEARLS Working Group **2022-**
- Member of ***NuSTAR*** Extragalactic Survey Team **2020-**
- Member of *Athena* Science Working Group **2020-**

- Co-organizers of CfA High Energy Astrophysics Division Seminar **2021-2023**

+ Panelist for NASA ***NuSTAR*** Proposal Review
+ External reviewer for CFHT
+ Reviewer for ApJ, A&A

## Invited Talks

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|---|---|
| Caltech, Tea Talk | **May 2024** |
| Caltech, HEA Group Meeting | **May 2024** |
| Zhejiang University, Colloquium | **Sep 2023** |
| Peking University, KIAA-DoA Seminar | **Aug 2023** |
| Tsinghua University, Departmental Seminar | **Aug 2023** |
| UIUC, local group meeting | **May 2023** |
| Yale University, Galaxy Lunch Talk | **Apr 2023** |
| MIT, Brown Bag Lunch Talk | **Apr 2023** |
| NASA GSFC, X-ray Astrophysics Laboratory AGN Seminar (Virtual) | **Feb 2023** |
| CfA, High Energy Seminar | **Feb 2023** |
| Arizona State University, Cosmology Seminar | **Dec 2022** |
| University of Arizona, Steward Observatory/NOIRLab Galaxy group seminar | **Dec 2022** |
| MIT, High Energy Astro Group seminar (Virtual) | **Apr 2022** |
| Clemson University, Local Group seminar | **Apr 2022** |
| INAF OAS, Bologna, X-ray group seminar | **Sep 2019** |

## Conferences & Contributed Talks

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|---|---|
| High Energy Astrophysics Division 21th Meeting (*Contributed Talk*) | Texas, **Apr 2024** |
| 243st AAS Meeting (*Contributed Talk*) | New Orleans, **Jan 2024** |
| High Energy Astrophysics Division 20th Meeting (*Contributed Talk*) | Waikōloa, **Mar 2023** |
| 241st AAS Meeting (*Contributed Talk*) | Seattle, **Jan 2023** |
| *NuSTAR* 2022 Conference (*Contributed Talk*) | Italy, **June 2022** |
| New England Regional Quasar and AGN Meeting (*Contributed Talk*) | Storrs, **May 2022** |
| High Energy Astrophysics Division 19th Meeting (*Poster*) | Pittsburgh, **Mar 2022** |
| Black Hole Across Space and Time (*Contributed Talk*) | Virtual, **Dec 2021** |
| 238th AAS Meeting (*Dissertation Talk*) | Virtual, **June 2021** |
| 237th AAS Meeting (*Contributed Talk*) | Virtual, **Jan 2021** |
| Supermassive Black Holes Meeting (*Contributed Talk*) | Virtual, **Dec 2020** |
| 235th AAS Meeting (*Contributed Talk*) | Honolulu, **Jan 2020** |
| X-ray Astronomy 2019 Meeting (*Poster*) | Bologna, Italy, **Sep 2019** |
| High Energy Astrophysics Division 17th Meeting (*Poster*) | Monterey, **Mar 2019** |
| 233rd AAS Meeting (*Contributed Talk*) | Seattle, **Jan 2019** |

## Mentoring & Assistant Experience

Co-supervision of Clemson graduate student R. Silver **2019-**
Co-supervision of Clemson graduate student A. Pizzetti **2019-2024**
Co-supervision of Clemson undergraduate students D. Cole and Z. Hu **2019**
Research Assistant, Clemson **2018-2020**
Teaching Assistant (PHYS 2230), Clemson **2016-2017**

## Workshops & Schools

CSST summer school at Peking University Beijing, China, **July 2023**
Summer School for Astrostatistics at Penn State State College, **Jun 2023**
End-to-end Simulations with SIXTE Workshop Virtual, **Mar 2022**
2022 Submillimeter Array Interferometery School Virtual, **Jan 2022**
Winter School at University of Freiburg Freiburg, Germany, **Feb 2015**
Summer School at University of California, Berkeley Berkeley, **Jun-July 2014**

## Press Release

Webb Glimpses Field of Extragalactic PEARLS, Studded With Galactic Diamonds **2022**

## Outreach & DEI

- The Silk Road Cameleers Series (Introduce AGN to Undergrads) Remote**, Apr, 2024**

† Volunteer to teach astronomy and mathematics to elemental and high school students in the rural area of China Qiajia, **Summer, 2023**

† Translate Sensing Dynamic Universe project into Chinese (help people with visual disability accessible to the dynamic Universe with sonified astromical light curves and spectra) **2022-2023**

## Reference

- Marco Ajello, PhD supervisor, majello@g.clemson.edu
- Francesca Civano, postdoc supervisor, francesca.m.civano@nasa.gov
- Yue Shen, postdoc supervisor, shenyue@illinois.edu
- Martin Elvis, postdoc co-supervisor, melvis@cfa.harvard.edu
- Stefano Marchesi, PhD co-supervisor, stefano.marchesi@inaf.it

## Publication List

A total of **30** peer-reviewed papers, **2** submitted papers **ADS**

### - First-author papers

**7)** **X. Zhao**, S. Marchesi, M. Ajello et al., Accepted to ApJ
*An X-ray Significantly Variable, Luminous, Type 2 Quasar at z = 2.99 with a Massive Host Galaxy*

**6)** **X. Zhao**, F. Civano, C. N. A. Willmer et al., 2024, ApJ, 965, 188
*PEARLS: The NuSTAR and XMM-Newton extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field II*

**5)** **X. Zhao**, F. Civano, F. M. Fornasini, et al. 2021, MNRAS, 508, 5176
*The NuSTAR extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field*

**4)** **X. Zhao**, S. Marchesi, M. Ajello, et al. 2021, A&A, 650, A57
*The properties of the AGN torus as revealed from a set of unbiased NuSTAR observations*

**3)** **X. Zhao**, S. Marchesi, M. Ajello, et al. 2020, ApJ, 894, 71
*A broadband X-ray study of a sample of AGNs with [OIII] measured inclinations*

**2)** **X. Zhao**, S. Marchesi, M. Ajello, 2019, ApJ, 871, 182
*Compton-thick AGN in the NuSTAR Era. IV. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in ESO 116-G018*

**1)** **X. Zhao**, S. Marchesi, M. Ajello, et al. 2019, ApJ, 870, 60
*Compton-thick AGNs in the NuSTAR Era. II. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in NGC 1358*

### - Second/Third author or significantly contributed papers

**10)** F. Civano, **X. Zhao**, P. Boorman, et al., 2024, Front. Astron. Space Sci., 1340719
*The High Energy X-ray Probe (HEX-P): X-ray population contributing to peak of the Cosmic X-ray background*

**9)** E. Kammoun, et al. (including **X. Zhao**), 2024, Front. Astron. Space Sci., 1308056
*The High Energy X-ray Probe (HEX-P): Probing the physics of X-ray corona in active galactic nuclei*

**8)** N. Torres-Albà, M. Stefano, **X. Zhao**, et al., 2023, A&A, 678, A154
*Hydrogen Column Density Variability in a sample of local Compton-thin AGN*

**7)** R. Silver, N. Torres-Albà, **X. Zhao**, et al., 2023, A&A, 675, A65
*A New Mid-Infrared and X-ray Machine Learning Algorithm to Discover Compton-thick AGN*

**6)** R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 940, 148
*Compton-thick AGN in NuSTAR Era. IX: joint NuSTAR and XMM-Newton analysis of four local AGN*

**5)** S. Marchesi, **X. Zhao**, N. Torres-Albà, et al. 2022, ApJ, 935, 114
*Compton-Thick AGN in the NuSTAR era VIII: A joint NuSTAR-XMM-Newton monitoring of the changing-look Compton-thick AGN NGC 1358*

**4)** R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 932, 43
*Chandra Follow-up Observations of Swift-BAT-selected AGNs II*

**3)** N. Torres-Albà, S. Marchesi, **X. Zhao**, et al. 2021, ApJ, 922, 252

*Compton-thick AGN in NuSTAR Era VI: The Observed Compton-thick Fraction in the Local Universe*

**2)** S. Marchesi, M. Ajello, **X. Zhao**, et al. 2019, ApJ, 882, 162
*Compton-thick AGNs in the NuSTAR Era. V. Joint NuSTAR and XMM-Newton Spectral Analysis of Three "Soft-gamma" Candidate CT-AGNs in the Swift/BAT 100-month Catalog*

**1)** S. Marchesi, M.Ajello, **X. Zhao**, et al. 2019, ApJ, 872, 8
*Compton-thick AGNs in the NuSTAR Era. III. A Systematic Study of the Torus Covering Factor*

## - Co-author papers

**15)** I. Cox, et al. (including **X. Zhao**), Submitted to AAS journals
*Chandra Follow-up Observations of Swift-BAT-Selected AGNs III*

**14)** D. Sengupta, et al. (including **X. Zhao**), Submitted to A&A
*A Multi-Wavelength Characterization of the Obscuring Medium at the Center of NGC 6300*

**13)** J. García, et al. (including **X. Zhao**), Accepted to Front. Astron. Space Sci.
*The High Energy X-ray Probe (HEX-P): Science Overview*

**12)** A. Pizzetti, et al. (including **X. Zhao**), Accepted to AAS journals
*Hydrogen column density variability in a sample of local Compton-thin AGN II*

**11)** N. S. Khatiya, et al. (including **X. Zhao**), 2024, ApJ, 971, 84
*Characterizing the γ-ray Emission from FR0 Radio Galaxies*

**10)** R O'Brien, et al. (including **X. Zhao**), 2024, ApJS, 272, 19
*TREASUREHUNT: Transients and Variability Discovered with HST in the JWST North Ecliptic Pole Time Domain Field*

**9)** P. Boorman, et al. (including **X. Zhao**), 2024, Front. Astron. Space Sci., 1335459
*The High Energy X-ray Probe (HEX-P): Probing the circum-nuclear environment in AGN down to extremely low luminosities*

**8)** I. Cox, et al. (including **X. Zhao**), 2023, ApJ, 958, 155
*A simple method to predict $N_H$ variability in active galactic nuclei*

**7)** S. P. Willner, et al. (including **X. Zhao**), 2023, ApJ, 958, 176
*PEARLS: JWST counterparts of micro-Jy radio sources in the Time Domain field*

**6)** C. N. A. Willmer, et al. (including **X. Zhao**), 2023, ApJS, 269, 21
*PEARLS: Near Infrared Photometry in the JWST North Ecliptic Pole Time Domain Field*

**5)** Q. Yang, et al. (including **X. Zhao**), 2023, ApJ, 953, 61
*Probing the Origin of Changing-look Quasar Transitions with Chandra*

**4)** D. Sengupta, et al. (including **X. Zhao**), 2023, A&A, 676, A103
*Compton-thick AGN in the NuSTAR Era IX: Analysis of seven local CT-AGN candidates*

**3)** R. A. Windhorst, et al. (including **X. Zhao**), 2023, AJ, 165, 13
*Webb's PEARLS: Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results*

**2)** A. Pizzetti, et al. (including **X. Zhao**), 2022, ApJ, 936, 149
*A multi-epoch X-ray study of the nearby Seyfert 2 galaxy NGC 7479: Linking column density variability to the torus geometry*

**1)** A. Traina, et al. (including **X. Zhao**), 2021, ApJ, 922, 159
*Compton-Thick AGN in the NuSTAR era VII: a joint NuSTAR, Chandra and XMM-Newton analysis of two nearby, heavily obscured sources*